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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,206	03/10/2006	Antoine Moulin	Q89340	8480

23373 7590 05/15/2009

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ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
05/15/2009	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/544,206
Filing Date: March 10, 2006
Appellant(s): MOULIN, ANTOINE

Keiko K. Takagi
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 9, 2009 appealing from the Office action mailed September 10, 2008.

I. Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

II. Related Appeals and Interferences

The examiner is not aware of any related appeals, interference, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

The statement of the status of claims contained in the brief is correct.

IV. Status of Amendments After Final

The appellant's statement of the status of amendment after final rejection contained in the brief is correct.

V. Summary of Claimed Subject Matter

The appellant's statement of the summary of claimed subject matter contained in the brief is correct.

VI. Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the ground of rejection to be reviewed on appeal contained in the brief is correct.

VII. Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

VIII. Evidence Relied Upon

US 4,336,080	Nakaoka et al.	June 1982
US 4,159,218	Chatfield et al.	June 1979

VIIII. Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaoka et al. (US 4,336,080) in view of Chatfield et al. (US 4,159,218).

With respect to claims 1-12, Nakaoka et al. ('080) discloses a method for producing a cold-rolled dual-phase steel sheet from a slab with a chemical composition comprising by weight: C: 0.02-0.06%; Mn: 0.05-0.30%; N: <0.005%; Al: 0.02-0.06%; P: 0.01-0.06%; Si: <0.20% (col. 5, line 49 – col. 7, line 10). The method comprises:

hot-rolling the steel slab heated to 1250^{o} C to prepare a hot-rolled steel strip (col. 10, lines 34-39);

coiling the hot-rolled strip at a temperature within the range of 650^{o} C to 770^{o} C (abstract);

cold-rolling the strip with a reduction ratio of 75% (col. 10, lines 34-44);

continuous-annealing the strip by heating the strip to a temperature within the range of 750^{o} C to 880^{o} C and holding it there for a pre-determined time (i.e. soaking) as claimed in the instant claim 6 (abstract);

cooling the strip to 750^{o} C by a gas jet followed by a rapid cooling by a water jet with a quenching rate of about 2000^{o} C/sec as claimed in the instant claims 10 and 12 (col. 10, lines 50-53);

over-aging the strip at a temperature within the range of 260^{o} C to 360^{o} C (abstract).

Nakaoka et al. ('080) does not teach that the slab contains chromium as in the instant claims 1 and 2.

Chatfield et al. ('218) discloses a substantially identical method for producing a ferritic martensitic dual-phase steel strip containing 0.1-0.7 wt% of Cr (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add by weight 0.1-0.7% of chromium into the slab as disclosed by Chatfield et al. ('218) in the composition of Nakaoka et al. ('080) in order to increase hardenability at a cost factor significantly lower than that found in a steel having an increased manganese content as disclosed by Chatfield et al. ('218) (col. 2, lines 8-16).

Nakaoka et al. ('080) in view of Chatfield et al. ('218) does not specify the hot-rolling finishing temperatures as claimed in the instant claims 3 and 4. However the hot-rolling finishing temperature is a result-effective variable, because it would directly affect the coiling temperature which would in turn affect the Lankford value (r) of the steel sheet as disclosed by Nakaoka et al. ('080) (col. 7, lines 17-23). Therefore, it would have been obvious to one of ordinary skill in the art to optimize the hot-rolling finishing temperature of Nakaoka et al. ('080) in view of Chatfield et al. ('218) in order to achieve the desired properties. See MPEP 2144.05 II.

Nakaoka et al. ('080) in view of Chatfield et al. ('218) does not disclose the cooling rates as claimed in the instant claims 9 and 11. However, it is well held that discovering an optimum value of a result-effective variable involves only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, the cooling rate after the continuous annealing is a result-effective variable, because it

would directly affect the carbon content in ferrite and the microstructure of the steel as disclosed by Nakaoka et al. ('080) (col. 8, line 30 to col. 9, line 19). An ordinary skilled in the art would have optimized the cooling rate in the process of Nakaoka et al. ('080) in view of Chatfield et al. ('218) at the time the invention was made in order to achieve desired microstructure and properties of the dual-phase steel of Nakaoka et al. ('080) in view of Chatfield et al. ('218). See MPEP 2144.05 II.

The final strip of Nakaoka et al. ('080) in view of Chatfield et al. ('218) has a dual-phase structure of ferrite and a low-temperature transformation phase (abstract). The volume ratio of the low-temperature transformation phase is up to 10% of the structure as a whole (col. 9, lines 3-7). Nakaoka et al. ('080) in view of Chatfield et al. ('218) does not specify that the low-temperature transformation phase is martensite as claimed. However, it has been well held where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical process, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I. In the instant case, the cold-rolled dual-phase steel sheet of Nakaoka et al. ('080) in view of Chatfield et al. ('218) is identical or substantially identical to that of the instant disclosure, therefore a prima facie case of obviousness exists. The same ferritic and martensitic structure would be expected in the steel sheet of Nakaoka et al. ('080) in view of Chatfield et al. ('218) as in the claimed steel strip.

The contents of C, Mn, Cr, Si, P, Al and N in the slab of Nakaoka et al. ('080) in view of Chatfield et al. ('218) overlap the claimed contents in the instant claims 1 and 2

respectively; the coiling temperature range of Nakaoka et al. ('080) in view of Chatfield et al. ('218) is within the claimed range in the instant claim 1; the cold-rolling reduction ratio of Nakaoka et al. ('080) in view of Chatfield et al. ('218) is within the claimed ranges in the instant claims 1 and 5; the soaking temperature range in the continuous annealing of Nakaoka et al. ('080) in view of Chatfield et al. ('218) overlaps the claimed ranges in the instant claims 1, 7 and 8; the over-aging temperature of 260°C of Nakaoka et al. ('080) in view of Chatfield et al. ('218) is close to the claimed tempering temperature of 250°C in the instant claim 1; the percentage of the low temperature transformation phase in the whole structure of Nakaoka et al. ('080) in view of Chatfield et al. ('218) also overlaps the claimed martensite percentage in the instant claim 1. The overlapping ranges establish a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the claimed ranges within the disclosed ranges of Nakaoka et al. ('080) in view of Chatfield et al. ('218) with expected success, because Nakaoka et al. ('080) in view of Chatfield et al. ('218) discloses the same utility over the entire disclosed ranges.

X. Response to Argument

The appellant's arguments in the Appeal Brief filed on March 9, 2009 have been fully considered, but they are not persuasive.

First, the appellant argues that the composition of Nakaoka et al. ('080) does not contain Cr as claimed. In response, the examiner notes that as stated in the section

above, the combination of Nakaoka et al. ('080) and Chatfield et al. ('218) with a proper motivation renders the claimed Cr content obvious to one of ordinary skill in the art.

Second, the appellant argues that the steel of Nakaoka et al. ('080) does not contain martensite. In response, the examiner notes that Nakaoka et al. ('080) discloses the final high-strength steel strip has a dual-phase structure of ferrite and a low-temperature transformation phase (abstract). It would have been obvious to one of ordinary skill in the art that the low-temperature transformation phase as disclosed by Nakaoka et al. ('080) comprises martensite and bainite. The application of In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I as the ground of rejection of the claimed steel strip having a dual-phase structure of ferrite and martensite as stated in the section above is proper and maintained.

Third, the appellant argues that the tensile strengths shown in the Table 2 of Nakaoka et al. ('080) are much lower than those shown in page 9 of the instant specification, indicating the steel strips of Nakaoka et al. ('080) do not contain martensite at the end of the process. In response, see examiner's response to appellant's 2nd argument above. The example notes that the comparison of the tensile strengths listed in the Table 2 of Nakaoka et al. ('080) with those listed in page 9 of the instant specification is not rational, because the samples of Nakaoka et al. ('080) and the instant invention are different in terms of chemical compositions and processes. Furthermore, there are no tensile strength values recited in the instant claims.

Fourth, the appellant argues that the compositions and processes of Nakaoka et al. ('080) and Chatfield et al. ('218) are different. In response, see examiner's response

to appellant's 1st argument above. The examiner notes that both processes are used for producing dual-phase steel strips. They are substantially identical even though some steps are different due to the differences in the compositions of the steels. The processes do not have to be exactly the same to combine Chatfield et al. ('218) with Nakaoka et al. ('080) to meet the claim limitation of the Cr content.

Fifth, the appellant argues that Nakaoka et al. ('080)'s steel contains only ferrite. In response, see examiner's response to appellant's 2nd argument above. It would have been obvious to one of ordinary skill in the art that Nakaoka et al. ('080)'s steel is a dual-phase steel.

Sixth, the appellant argues that Nakaoka et al. ('080) expressly seeks a steel with reduced tensile strength. In response, the examiner notes the title of "Method for Manufacturing High-Strength Cold-Rolled Steel Strip Excellent in Press-Formability" of Nakaoka et al. ('080) clearly indicates that seeking a steel with reduced tensile strength is not the objective of Nakaoka et al. ('080).

Seventh, the appellant argues that the claimed steel unexpectedly provides both a high tensile strength and a good drawing behavior. In response, the examiner notes that there are no tensile strength and drawability values recited in the instant claims. Furthermore, the claimed and Nakaoka et al. ('080) in view of Chatfield et al. ('218)'s cold-rolled dual-phase steel strips are identical or substantially identical in structure or composition and are produced by identical or substantially identical processes as discussed above, therefore a prima facie case of obviousness exists. The same tensile strength and drawing behavior would be expected in the steel strip of Nakaoka et al.

('080) in view of Chatfield et al. ('218) as in the claimed steel strip. See MPEP 2112.01 [R-3] I.

XI. Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and interferences section of the examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Weiping Zhu/

Weiping Zhu

Patent Examiner, Art Unit 1793

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/Roy King/

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